AMENDMENTS TO THE CLAIMS

1. (presently amended) A compound of formula **I**

B-R-A-NHNH2·HX

I

wherein;

A is NH(C=O)-, NH(C=S)-, NHNH(C=O)-, ~~-NHNH(C=S)-,~~ or a direct bond to R;

B is an amino or thiol reactive moiety;

R is an aliphatic divalent group having any combination of the following groups, which are combined in any order: cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})R^{13})$ and C(L); where a is 0,1 or 2, b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O, $N(R^{10})$; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}, J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl,

heteroaralkyl, heteroaralkenyl, heteroalkynyl, heterocyclyl, heterocycloalkyl, heterocyclylalkenyl, heterocyclylalkynyl; hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkyloxy, aryl, aralkyl, arakenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroalkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, arakenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, ~~alkoxycarbonyl,~~ carboxyaryl, halo, pseudohalo, haloalkyl, and caboximido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarysilyl, triarylsilyl, alkyl, alkenyl,

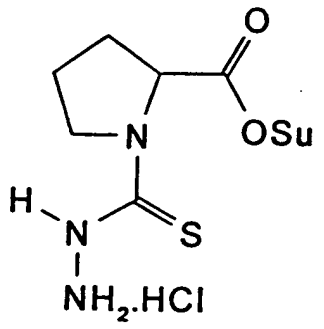
alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, arakenyl, aralkynyl, heteroaryl, heteroaralkyl, heterolalkenyl, heteroalkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteraralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino; and

X is a negative counterion.

2. (original) The compound of claim 1, wherein R is, or is a combination of, a saturated straight chain of 1 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms.

3. (cancelled)

4. (Original) The compound of claim 1 that is:



5. (Original) A compound of formula II:

B-R-A-NHN=C(R^1R^2) II

or a derivative thereof, wherein:

A is NH(C=O)-, NH(C=S)-, NHNH(C=O)-, or NHNH(C=S)- or a direct bond to R;

B is an amino or thiol reactive moiety;

R is an aliphatic divalent group having any combination of the following groups, which are combined in any order: cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O

or NR^{15}; R^{14} and R^{15} are each independently select d from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alk nyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, het roaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, h t rocyclylalkyl, het rocyclylalk nyl,

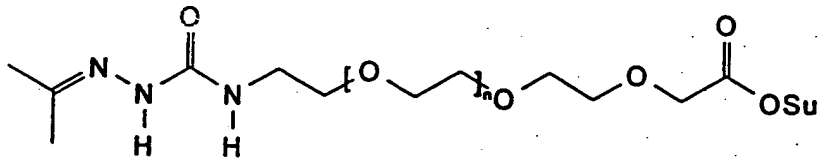
heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, het roaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino;

R^1 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms; and

R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms.

6. (Original) The compound of claim 5, wherein R is, or is a combination of, a saturated straight chain of 1 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms.

7. (Original) The compound of claim 5 that is:



n = 2 - 2000

8. (Original) A compound of formula III:

$B\text{-}R\text{-}(C{=}O)\text{-}NHNH_2{\bullet}HX$ III

or a derivative thereof, wherein:

B is an amino reactive moiety;

R is an aliphatic divalent group having any combination of the following groups, which are combined in any order: cycloalkylene, $C(R^{10})_2$, $-C(R^{10}){=}C(R^{10})-$, $>C{=}C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C{\equiv}C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and $M^1\text{-}R^{14}$; ach M^1 is a divalent group independently having any combination of the following gr ups, which groups are combined in any order: a dir ct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$,

$-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrog n, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl,

triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, h t roaralkenyl, h teroaralkynyl, h t rocyclyl, heterocyclylalkyl, h terocyclylalk nyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino; and

X is a negative counterion.

9. (Original) The compound of claim 8, wherein R is, or is a combination of, a saturated straight chain of 1 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms.

10. (Original) A compound that has one of formulae VII or VIII:

$B\text{-}R\text{-}ONH_2 \bullet HX$ VII; or

$B\text{-}R\text{-}ON=C(R^1R^2)$ VIII

or a derivative thereof, wherein:

R is a divalent group having any combination of the following groups, which are combined in any order: arylene, heteroarylene, cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and $M^1\text{-}R^{14}$; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralk nyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl,

heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino;

B is an amino or thiol reactive moiety;

R^1 is H or a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, a saturat d or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

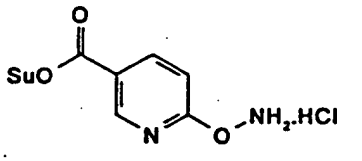
R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms; and

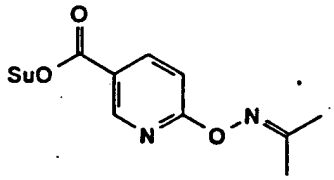
X is a negative counterion.

11. (Original) The compound of claim 10, wherein R is a straight chain, branched or cyclic aliphatic moiety, a aromatic, heteroaromatic, polyaromatic or polyheteroaromatic moiety, a saturated straight chain of 2 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms, or or a combination thereof.

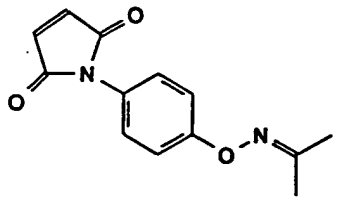
12. (Original) The compound or claim 10, wherein R is a divalent aliphatic group.

13. (Original) The compound of claim 10, selected from:

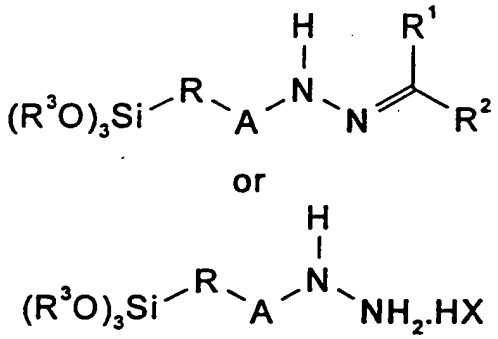




and



14. (Original) A compound that has any of formulae XI:



or

XI

or a derivative thereof, wherein:

R^3 is a straight chain, branched or cyclic alkyl group of 1 – 10 carbons;

R^1 is H or a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

X is a negative counterion;

R is a divalent group having any combination of the following groups, which are combined in any order: arylene, heteroarylene, cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro,

$SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralk nyl, heteroaralkynyl, heterocyclyl, h terocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

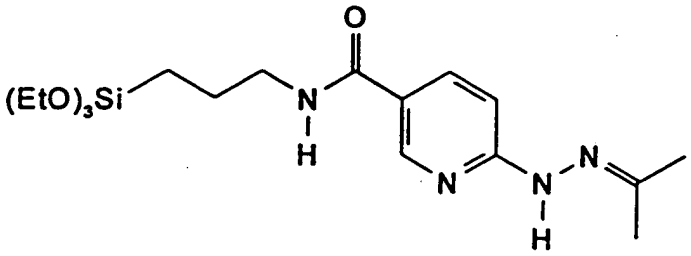
R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamin , alkylarylamino, diarylamino and

arylamino; and

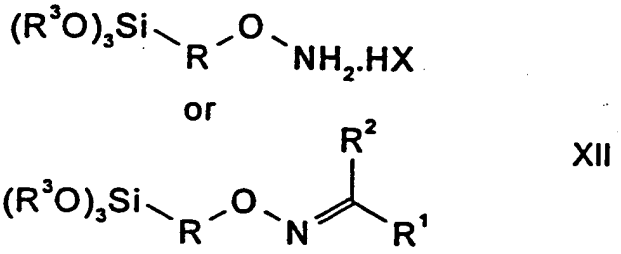
A is a direct link, NH(C=O), NH(C=S), NHNH(C=O), or NHNH(C=S).

15. (Original) The compound of claim 14, wherein R is a straight chain, branched or cyclic alkyl group of 2-15 carbons, a polyethyleneglycol moiety of 2-2000 monomers or an aromatic group, or a combination thereof.

16. (Original) The compound of claim 14 that is:



17. (Original) A compound that has one of formulae XII:



or

XII

or a derivative thereof, wherein:

R^3 is a straight chain, branched or cyclic alkyl group of 1 – 10 carbons;

R^1 is H or a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

X is a negative counterion; and

R is a divalent group having any combination of the following

groups, which are combined in any order: arylene, heteroarylene, cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is s lected from alkyl, alkenyl, alkynyl, aryl, cycl alkyl,

cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, het rocyclyl, h teroaryloxy, het rocyclyloxy, aralkyl, aralk nyl, aralkynyl, h t roaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino.

18. (Original) The compound of claim 17, wherein R is a straight chain, branched or cyclic alkyl group of 2-15 carbons, a polyethyleneglycol moiety of 2-2000 monomers or an aromatic group, or a combination thereof.

19. (Original) A compound that has any of formulae XIII:

$R^{30}S\text{-}R\text{-}A\text{-}NHNH_2.HX$,

$R^{30}S\text{-}R\text{-}A\text{-}NHN=CR^1R^2$,

$(S\text{-}R\text{-}A\text{-}NHNH_2.HX)_2$, or

$(S\text{-}R\text{-}A\text{-}NHN=CR^1R^2)_2$;

or a derivative thereof, wherein

R^1 is H or a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

X is a negative count rion; and

R is a divalent group having any combination of the following groups, which are combined in any order: arylene, heteroarylene, cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently selected from among hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alkenylene or cycloalkylene; R^{16}, R^{17} and R^{18} are each independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

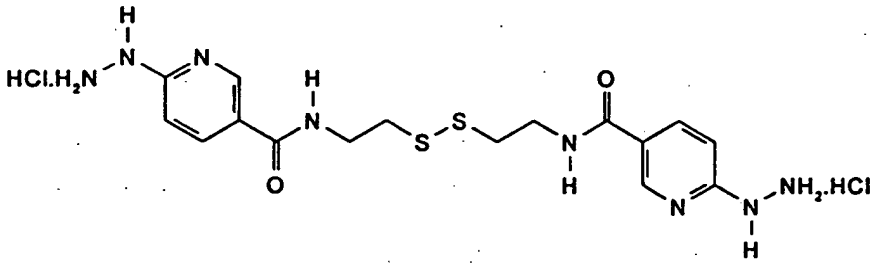
R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z,

wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino;

A is a direct link, C=O, C=S, NH(C=O), NH(C=S), NHNH(C=O), or NHNH(C=S); and

R^{30} is hydrogen or a thiol protecting group.

20. (Original) The compound of claim 19 that is:



21. (Original) A compound that has one of formulae XIII:

R^{30}S-R-ONH_2.HX,

R^{30}S-R-ON=CR^1R^2,

(S-R-ONH_2.HX)$_2$, or

(S-R-ON=CR^1R^2)$_2$;

or a derivative ther of, wh r in

R^1 is H or a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

R^2 is a saturated straight chain of 3 to 20 carbon atoms, a chain of 2 to 2000 ethyleneoxide moieties, or a saturated or unsaturated carbocyclic moiety of 3 to 20 carbon atoms;

X is a negative counterion; and

R is a divalent group having any combination of the following groups, which are combined in any order: arylene, heteroarylene, cycloalkylene, $C(R^{10})_2$, $-C(R^{10})=C(R^{10})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G)_a$, $P(J)_b(R^{10})$, $P(J)_b(LR^{10})$, $N(R^{10})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G is O or NR^{10}; J is S or O; and L is S, O or NR^{10}; each R^{10} is a monovalent group independently selected from hydrogen and M^1-R^{14}; each M^1 is a divalent group independently having any combination of the following groups, which groups are combined in any order: a direct link, arylene, heteroarylene, cycloalkylene, $C(R^{15})_2$, $-C(R^{15})=C(R^{15})-$, $>C=C(R^{12})(R^{13})$, $>C(R^{12})(R^{13})$, $-C\equiv C-$, O, $S(G^1)_a$, $P(J)_b(R^{15})$, $P(J)_b(LR^{15})$, $N(R^{15})$, $N(COR^{15})$, $>N^+(R^{12})(R^{13})$ and C(L); where a is 0, 1 or 2; b is 0, 1, 2 or 3; G^1 is O or NR^{15}; J is S or O; and L is S, O or NR^{15}; R^{14} and R^{15} are each independently selected from the group among hydrogen, halo, pseudohalo, cyano, azido, nitro, $SiR^{16}R^{17}R^{18}$, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; R^{19} and R^{20} are each independently selected from hydrogen, alkyl, alkenyl, alkynyl, cycloalkyl, aryl, aralkyl, heteroaryl, heteroaralkyl and heterocyclyl; R^{12} and R^{13} are selected from (i) or (ii) as follows: (i) R^{12} and R^{13} are independently s l cted from among hydrogen, alkyl, alk nyl, alkynyl, cycloalkyl, aryl and heteroaryl; or (ii) R^{12} and R^{13} together form alkylene, alk nylene or cycloalkyl n ; R^{16}, R^{17} and R^{18} are each

independently a monovalent group selected from hydrogen, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy and $NR^{19}R^{20}$; and

R^{11}, R^{12}, R^{13}, R^{14}, R^{15}, R^{16}, R^{17}, R^{18}, R^{19} and R^{20} can be substituted with one or more substituents each independently selected from Z, wherein Z is selected from alkyl, alkenyl, alkynyl, aryl, cycloalkyl, cycloalkenyl, hydroxy, $S(O)_hR^{30}$, $NR^{30}R^{31}$, $COOR^{30}$, COR^{30}, $CONR^{30}R^{31}$, $OC(O)NR^{30}R^{31}$, $N(R^{30})C(O)R^{31}$, alkoxy, aryloxy, heteroaryl, heterocyclyl, heteroaryloxy, heterocyclyloxy, aralkyl, aralkenyl, aralkynyl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, aralkoxy, heteroaralkoxy, alkoxycarbonyl, carbamoyl, thiocarbamoyl, alkoxycarbonyl, carboxyaryl, halo, pseudohalo, haloalkyl and carboxamido; h is 0, 1 or 2; and R^{30} and R^{31} are each independently selected from among hydrogen, halo, pseudohalo, cyano, azido, nitro, trialkylsilyl, dialkylarylsilyl, alkyldiarylsilyl, triarylsilyl, alkyl, alkenyl, alkynyl, haloalkyl, haloalkoxy, aryl, aralkyl, aralkenyl, aralkynyl, heteroaryl, heteroaralkyl, heteroaralkenyl, heteroaralkynyl, heterocyclyl, heterocyclylalkyl, heterocyclylalkenyl, heterocyclylalkynyl, hydroxy, alkoxy, aryloxy, aralkoxy, heteroaralkoxy, amino, amido, alkylamino, dialkylamino, alkylarylamino, diarylamino and arylamino; and

R^{30} is hydrogen or a thiol protecting group.

22. (Original) The compound of claim 1, wherein X is a halide or trifluoroacetate.

23. (Original) The compound of claim 1, wherein B is an amino reactive moiety selected from succininimidyl ester, hydroxybenzotriazolyl ester, or pentafluorophenol ester.

24. (Original) The compound of claim 1, wherein B is a thiol reactive moiety selected from maleimido, *α*-bromoacetyl or pyridyldisulfide.

25. (Original) A conjugate, comprising the compound of claim 1 bound to

a natural or synthetic biological molecule.

26. (Original) The conjugate of claim 25, wherein the natural or synthetic molecule is selected from a protein, a glycoprotein, a peptide, an oligonucleotide, an RNA, a DNA and a synthetic polymer.

27. (Original) The conjugate of claim 26, wherein the protein is an antibody.

28. (Original) A method of immobilizing a natural or synthetic biological molecule, comprising:

(i) preparing the conjugate of claim 25; and

(ii) applying the conjugate to a surface wherein the surface has at least one carbonyl moiety for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the surface forming a hydrazone bond to the surface.

29. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing the conjugate of claim 25; and

(ii) applying the conjugate to a surface wherein the surface has at least one amino or one thiol reactive moiety for a time and under conditions such that the conjugate reacts with the amino moiety or thiol moiety of the surface forming a bond to the surface.

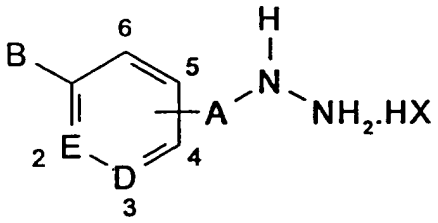
30. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing the conjugate of claim 25; and

(ii) mixing the conjugate with a natural or synthetic biological molecule wherein the molecule has at least one carbonyl moiety for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the molecule forming a hydrazone bond to the molecule.

31. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) pr paring a conjugate of formula IVa:



IVa

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

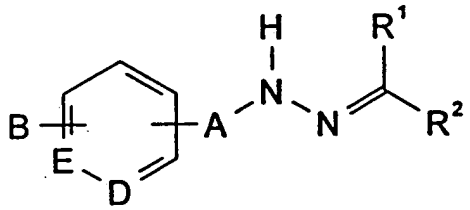
E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) applying the conjugate to a surface wherein the surface has at least one carbonyl moiety for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the surface forming a hydrazone bond to the surface.

32. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula Va:



Va

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

E is a carbon or nitrogen atom;

R^1 is hydrogen or a saturated straight chain of 1 to 12 carbon

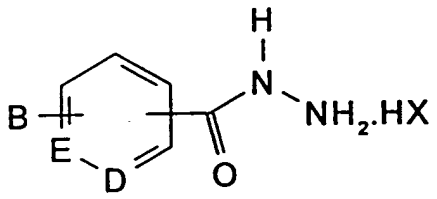
atoms; and

R^2 is hydrogen or a saturated straight chain of 1 to 12 carbon atoms; and

(ii) applying the conjugate to a surface wherein the surface has at least one amino or one thiol reactive moiety for a time and under conditions such that the conjugate reacts with the amino or thiol reactive moiety of the surface forming a bond to the surface.

33. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of the formula VIa:



VIa

or a derivative thereof, wherein:

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

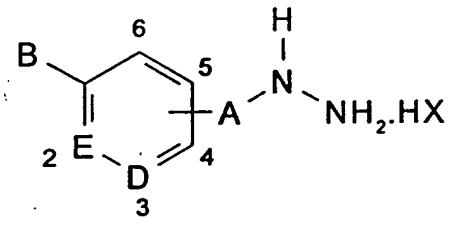
E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) applying the conjugate to a surface wherein the surface has at least one carbonyl moiety for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the surface forming a hydrazone bond to the surface.

34. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula IVa:



IVa

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

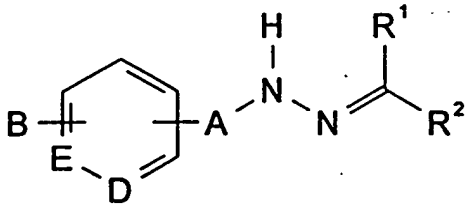
E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) applying the conjugate to a surface wherein the surface has at least one amino or one thiol reactive moiety for a time and under conditions such that the conjugate reacts with the amino or thiol reactive moiety of the surface forming a bond to the surface.

35. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula Va:



Va

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

E is a carbon or nitrogen atom;

R^1 is hydrogen or a saturated straight chain of 1 to 12 carbon

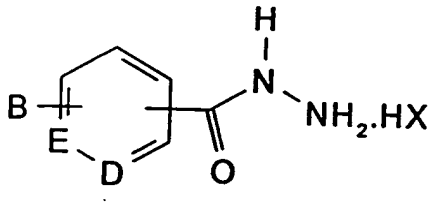
atoms; and

R^2 is hydrogen or asaturated straight chain of 1 to 12 carbon atoms; and

(ii) applying the conjugate to a surface wherein the surface has at least one amino or one thiol reactive moiety for a time and under conditions such that the conjugate reacts with the amino or thiol reactive moiety of the surface forming a bond to the surface.

36. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula VIa:



VIa

or a derivative thereof, wherein:

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

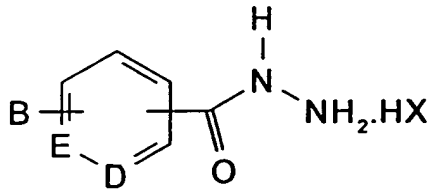
E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) applying the conjugate to a surface wherein the surface has at least one amino or one thiol reactive moiety for a time and under conditions such that the conjugate reacts with the amino or thiol reactive moiety of the surface forming a bond to the surface.

37. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula IVa:



IVa

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

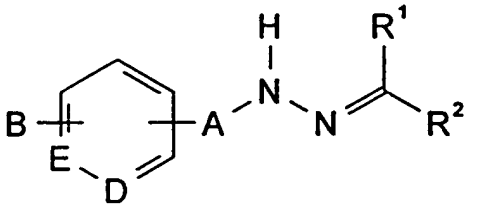
E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) mixing the conjugate to a natural or synthetic biological molecule, wherein the molecule has at least one carbonyl moiety, for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the molecule forming a hydrazone bond to the molecule.

38. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula Va:



Va

or a derivative thereof, wherein:

A is NH(C=O), NH(C=S), NH(C=NH), NHNH(C=O), NHNH(C=S), NHNH(C=NH) or a direct bond;

B is a natural or synthetic biological mol cule;

D is a carbon or nitrogen atom;

E is a carbon or nitrogen atom;

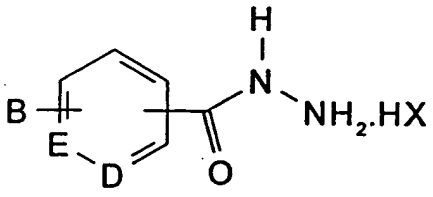
R^1 is hydrogen or a saturated straight chain of 1 to 12 carbon atoms; and

R^2 is hydrogen or a saturated straight chain of 1 to 12 carbon atoms; and

(ii) mixing the conjugate with a natural or synthetic biological molecule, wherein the molecule has at least one carbonyl moiety, for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the molecule forming a hydrazone bond to the molecule.

39. (Original) A method of crosslinking a natural or synthetic biological molecule, comprising:

(i) preparing a conjugate of formula VIa:



VIa

or a derivative thereof, wherein:

B is a natural or synthetic biological molecule;

D is a carbon or nitrogen atom;

E is a carbon or nitrogen atom; and

X is a negative counter ion, oxygen, sulfur or -NH; and

(ii) mixing the conjugate with a natural or synthetic biological molecule, wherein the molecule has at least one carbonyl moiety for a time and under conditions such that the hydrazine moiety of the conjugate reacts with the carbonyl moiety of the molecule forming a hydrazone bond to the molecule.

40. (Original) The method of claim 28, wherein the surface is selected from glass, polymer, latex and colloidal metal.

41. (Original) The method of claim 30, wherein the natural or synthetic biological molecule is selected from a protein, a glycoprotein, a peptide,

an oligonucleotide, an RNA and a DNA.

42. (Original) The method of claim 41, wherein the protein is an antibody.

43. (Original) A surface prepared by the method of claim 28.

44. (Original) A composition prepared by the method of claim 30.

45. (Original) The compound of claim 8, wherein X is a halide or trifluoroacetate.

46. (Original) The compound of claim 10, wherein X is a halide or trifluoroacetate.

47. (Original) The compound of claim 19, wherein X is a halide or trifluoroacetate.

48. (Original) The compound of claim 21, wherein X is a halide or trifluoroacetate.

49. (Original) The compound of claim 5, wherein B is an amino reactive moiety selected from succininimidyl ester, hydroxybenzotriazolyl ester, or pentafluorophenol ester.

50. (Original) The compound of claim 8, wherein B is an amino reactive moiety selected from succininimidyl ester, hydroxybenzotriazolyl ester, or pentafluorophenol ester.

51. (Original) The compound of claim 10, wherein B is an amino reactive moiety selected from succininimidyl ester, hydroxybenzotriazolyl ester, or pentafluorophenol ester.

52. (Original) The compound of claim 5, wherein B is a thiol reactive moiety selected from maleimido, α-bromoacetyl or pyridyldisulfide.

53. (Original) The compound of claim 10, wherein B is a thiol reactive moiety selected from maleimido, α-bromoacetyl or pyridyldisulfide.